

REMARKS

Entry of the amendments is respectfully requested. Claims 3 and 29-37 have been canceled, without prejudice. Claims 1, 2, 19, 20, and 23 have been amended. New claims 38-48 have been added. Claims 1-28 and 38-48 are pending in the application. Favorable reconsideration and allowance of this application is respectfully requested in light of the foregoing amendments and the remarks that follow.

1. **Amendments to the Claims**

Claims 19, 20, and 23 have been amended to correct minor typographical errors found upon a review of the application. The amendment to claim 20 in no way is believed to narrow the scope of the claim and is for clarification purposes only. The amendments to claims 19 and 23 are for clarification purposes only.

2. **Restriction Requirement**

The applicant acknowledges the final holding of the restriction requirement. Claims 29-37, the non-elected claims, have been canceled, without prejudice. Applicant reserves the right to file a divisional application on these claims.

3. Rejections Based on the Prior Art

a. Recapitulation of the Invention¹

The invention relates to methods of making acid and rennet-based cheeses that include processing a previous lot of milk to produce curds and whey from the previous lot of milk, and removing the whey from the curd. Whey and wash water (when used) include fine particles of curd, which are collected, added, and mixed into a subsequent lot of milk preferably using a mixer such as a homogenizer or colloid mill. Mixing preferably reduces the fine particle size of at least a plurality of the fine particles and increases the total amount of surface area thereof. Reducing the particle size of the fine particles increases the rate of solubilization of the fine particles in the subsequent lot of milk. Fine particles are reincorporated into the matrix of the curd made from the subsequent lot of milk, which increases curd yield.

b. Rejection of Claims 1-28 Under § 103

The rejection of claims 1-28 as unpatentable over U.S. Patent No. 4,957,751 to Lehmann et al. in view of Kosikowski (Chapter 8) is respectfully traversed, because, *inter alia*, there is no teaching or suggestion to combine or modify the references to produce the claimed invention. MPEP §2143.01. Furthermore, even if the references were combined, the invention would not result. The Examiner correctly recognizes that Lehmann et al. fails to show the use of a colloid

¹ This Section 3a is intended to provide the Examiner with some background information on the state of the art and applicant's contribution to it. It is *not* intended to distinguish specific claims from the prior art. That task is performed in Section 3b below.

mill, homogenization, and pasteurization. However, citing Kosikowski does nothing to cure its deficiencies.

Lehmann et al. discloses a method of producing rennet cheese from raw milk. The raw milk is standardized, a biological reaction is terminated, a precipitant and cultures are added, cheese mass is separated from whey, and denatured cheese fines are removed from the whey by separation or decantation. The cheese fines are biologically acidified in whey or water, the denatured proteins are removed from the whey or water, the denatured proteins are removed from the whey by separation or decantation, whereby the major proportion of the detrimental calcium is removed along with the separated liquid, the fines are suspended in water or whey, the suspension is warmed for 5 to 10 minutes at 40° to 60° C, the pH is adjusted to 6.5 to 7.0 with a 10% neutralization agent, the material is heated to from 80° to 90° C for 1 to 5 minutes, and the product is returned to the raw milk or added to other dairy products to increase the protein content or the proportion of dry mass. (Abstract).

Claim 1 has been amended to require "mixing the fine particles of cheese curd from the previous lot of milk into the subsequent lot of milk to form the cheese so as to mechanically reduce the particle size of at least a plurality of the fine particles of cheese curd." Reducing the particle size of the fine particles of cheese increases the rate of solubilization of the fine particles in the subsequent lot of milk. Lehmann et al. fails to teach or suggest mechanically reducing the particle size of at least a plurality of fine particles of cheese curd. This step clearly is neither taught nor suggested by Lehmann et al.

Kosikowski fails to cure this deficiency. Kosikowski teaches using an homogenizer to restore the normal smoothness of cream dressing for cottage cheese and to homogenize cream dressing for cottage cheese. However, Kosikowski does not teach or suggest mechanically reducing the particle size of at least a plurality of fine particles of cheese curd, as amended claim 1 requires. In fact, Kosikowski's only discussion of fine particles of cheese curd is that "Gentle, uniform cutting keeps the curd from disintegrating into fine particles, and thus avoids heavy yield loss." (Chapter 7, page 93, lines 2-3). Thus, Kosikowski, alone or in combination with Lehmann et al. fails to teach or suggest "mixing the fine particles of cheese curd from the previous lot of milk into the subsequent lot of milk to form the cheese so as to mechanically reduce the particle size of at least a plurality of the fine particles of cheese curd," as amended claim 1 requires.

Claims 2-27 depend directly or indirectly from claim 1 and are believed to be in condition for allowance for incorporating by reference the limitations of claim 1 and for defining additional features of the invention, which, when considered in combination with those of claim 1, are neither taught nor suggested by the prior art relied upon in the rejection.

For example, claim 2 has been amended to require "increasing the total surface area of the fine particles of cheese curd." Lehmann et al. fails to teach or suggest this step. In Lehmann et al., fine particles are heated. Heating will shrink the fine particles, which will *decrease* the total surface area of the fine particles. In contrast, amended claim 2 requires *increasing* the total

surface area of the fine particles. *See ¶¶ 4-5 of Dr. Robert L. Bradley's Rule 132 Declaration*, which is submitted herewith and incorporated herein in its entirety by reference.

Kosikowski fails to cure this deficiency. Although Kosikowski teaches using an homogenizer to restore the normal smoothness of cream dressing for cottage cheese and to homogenize cream dressing for cottage cheese, Kosikowski does not teach or suggest "increasing the total surface area of the fine particles of cheese curd," as amended claim 2 requires. Thus, even if the references were combined, the invention would not result. Therefore, the references, alone or in combination, fail to teach or suggest the method of claim 2.

Claim 3 has been canceled, obviating the rejection of this claim.

Claims 5 and 6 both require "wherein the mixing step comprises inhibiting the fine particles of cheese curd from settling out of the subsequent lot of milk." Lehmann et al., alone or in combination with Kosikowski, fails to teach or suggest this step. In fact, in Lehmann et al. there is an optional step of clarifying the cheese fines before they are mixed with a medium, such as milk or another dairy product. From this, it appears that in the Lehmann et al. process there is a problem with the cheese fines settling out. Hence, claims 5 and 6 define over the prior art of record. *See ¶¶ 6-7 of Dr. Robert L. Bradley's Rule 132 Declaration*.

Claim 7 requires the use of a colloid mill to reduce the particle size of at least a plurality of the fine particles of cheese curd and to increase surface area of the fine particles of cheese curd. As the Examiner admits, Lehmann et al. does not use a colloid mill. The Examiner cites Kosikowski as teaching the use of homogenization. However, Kosikowski does not teach the

use of a colloid mill at all, much less specifically the use of a colloid mill to mix fine particles of cheese curd into a subsequent lot of milk. Therefore, the combined references do not teach the method of claim 7.

In claim 9, the mixing step comprises mixing without demineralization of the fine particles. In contrast, Lehmann et al. specifically requires decalcification of the fine particles and specifically states that the calcium causes a problem in the production of rennet cheeses in that the calcium content makes it impossible to reliquify the fine particles without adding emulsifying salts. Lehmann et al. particularly teaches that the calcium creates bridges between the casein micelles and accordingly impedes reliquification of cheese fines. Lehmann et al. further notes that although the emulsifying salts do bond the calcium components enough to allow reliquification, the salts remain in the product and make it impossible to use the cheese fines even for producing processed cheese. Thus, the Lehmann et al. patent teaches that calcium causes problems in cheese making processes and must be removed. This language strongly teaches away from the claimed invention. A prior art reference teaches away from the proposed combination of references if it leaves the impression that the product would not have the property sought by the applicant. *In re Caldwell*, 319 F.2d 254, 256, 138 USPQ 243, 245 (C.C.P.A. 1963). "It is improper to combine references where the references teach away from their combination." MPEP 2145 (citing *In re Grasselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed. Cir. 1983)). Thus, it is improper to combine the teachings of Lehmann et al. with those of Kosikowski. Further, Kosikowski does not teach or suggest mixing without demineralizing the

fine particles. Therefore, even if the references were combined, the invention would not result.

Thus, claim 9 is allowable over the combination of references.

Claim 14 requires "further comprising washing the curds with a wash water, wherein the wash water contains fine particles of cheese curd; and collecting the fine particles of cheese curd from the wash water." Lehmann et al. fails to teach or suggest this step of washing. In fact, rennet-based cheese, which is what the Lehmann et al. cheese is, does not require washing cheese curd with water. *See ¶¶ 8-9 of Dr. Robert L. Bradley's Rule 132 Declaration.* Therefore, one skilled in the art would not modify the teachings of Lehmann et al. to include this step, and claim 14 is allowable over the cited references.

Claims 15-17, 24, and 26 require the use of a homogenizer to mix the fine particles of cheese curd into the subsequent lot of milk to form cheese so as to mechanically reduce the particle size of at least a plurality of the fine particles of cheese curd. Although Kosikowski teaches using an homogenizer to restore the normal smoothness of cream dressing for cottage cheese and to homogenize cream dressing for cottage cheese, Kosikowski does not teach or suggest using a homogenizer to mix the fine particles of cheese curd from the previous lot of milk into the subsequent lot of milk to form cheese so as to mechanically reduce the particle size of at least a plurality of the fine particles of cheese curd, as these claims require. Therefore, claims 15-17, 24, and 26 are nonobvious over Lehmann et al., alone or in combination with Kosikowski.

Claim 27 requires "wherein the fine particles of cheese curd from the previous lot of milk are incorporated into the matrix of the cheese curd of the subsequent lot of milk." This requirement is neither taught nor suggested by Lehmann et al., alone or in combination with Kosikowski. Thus, the references of record do not render claim 27 obvious.

Independent claim 28 requires the step of washing the curds with a wash water "wherein the wash water contains fine particles of cheese curd; and collecting the fine particles of cheese curd from the wash water." As detailed above with respect to claim 14, this step is neither taught nor suggested by Lehmann et al., alone or in combination with Kosikowski. Therefore, independent claim 28 is allowable over the combination of references.

4. New Claims

New claims 38-48 have been added. Independent claim 39 recites a method of making cheese and requires "wherein the mixing step comprises mixing without demineralization of the fine particles." Independent claim 41 recites a method of making cheese and requires "wherein the mixing step comprises mixing without decalcification of the fine particles." Claim 38 depends from claim 9, and claim 40 depends from claim 39. Both claims 38 and 40 further require "wherein the mixing step comprises mixing without decalcification of the fine particles." As discussed above with respect to claim 9, Lehmann et al. teaches that calcium causes problems in cheese making and that it should be removed. Thus, Lehmann et al. teaches away from these claims and should not be combined with Kosikowski. Further, since Kosikowski does not teach

or suggest this step, even if the references were combined, the invention would not result.

Therefore, these claims are non-obvious over Lehmann et al.

New claim 42 recites a method of making cheese and requires "wherein the mixing step comprises mechanically reducing the particle size of at least a plurality of the fine particles of cheese curd." As detailed above, Lehmann et al. fails to teach or suggest this step, and Kosikowski cannot cure this deficiency. Although Kosikowski teaches using an homogenizer to restore the normal smoothness of cream dressing for cottage cheese and to homogenize cream dressing for cottage cheese, Kosikowski does not teach or suggest mechanically reducing the particle size of at least a plurality of fine particles of cheese curd, as claim 42 requires.

Therefore, even if the references were combined, the invention would not result. Accordingly, claim 42 is allowable over the prior art of record and its allowance is respectfully requested.

Dependent claims 43-47 are believed to be in condition for allowance for incorporating by reference the limitations of claim 42 and for defining additional features of the invention, which, when considered in combination with those of claim 42, are not disclosed by the prior art relied upon in the rejection. The allowance of claims 43-47 is respectfully requested.

Independent claim 48 recites a method of making cheese and requires "integrating the fine particles of cheese curd from the previous lot of milk into the subsequent lot of milk to form the cheese so as to increase the total surface area of the fine particles of cheese curd in the subsequent lot of milk." Neither Lehmann et al. nor Kosikowski, alone or in combination, discloses, teaches, or suggests integrating, such as by mixing, fine particles of cheese curds in a

manner that increases the total surface area of the fine particles when in the subsequent lot of milk. While Lehmann et al. discloses heating the fine particles, it does not do so in a manner that increases the total fine particle surface area because the heating disclosed in Lehmann et al. shrinks fine particles which reduces total fine particle surface area. For at least these reasons, newly presented independent claim 48 is believed to be allowable and its allowance is respectfully requested.

CONCLUSION

It is submitted that original claims 1-28 are in compliance with 35 U.S.C. § 103 and each define patentable subject matter. New claims 38-46 are also believed to be allowable. A Notice of Allowance is therefore respectfully requested.

Enclosed is a check in the amount of \$271 in payment of (1) the fee by a small entity for one independent claim in excess of three (\$43), and two claims in excess of twenty (\$18) and (2) the \$210 fee associated with a two-month extension of time, which the applicant hereby requests. No other fee is believed to be payable with this communication. Nevertheless, should the Examiner consider any other fees to be payable in conjunction with this or any future communication, the Director is authorized to direct payment of such fees, or credit any overpayment to Deposit Account No. 23-2053.

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The Examiner is invited to contact the undersigned by telephone if it would help expedite
matters.

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